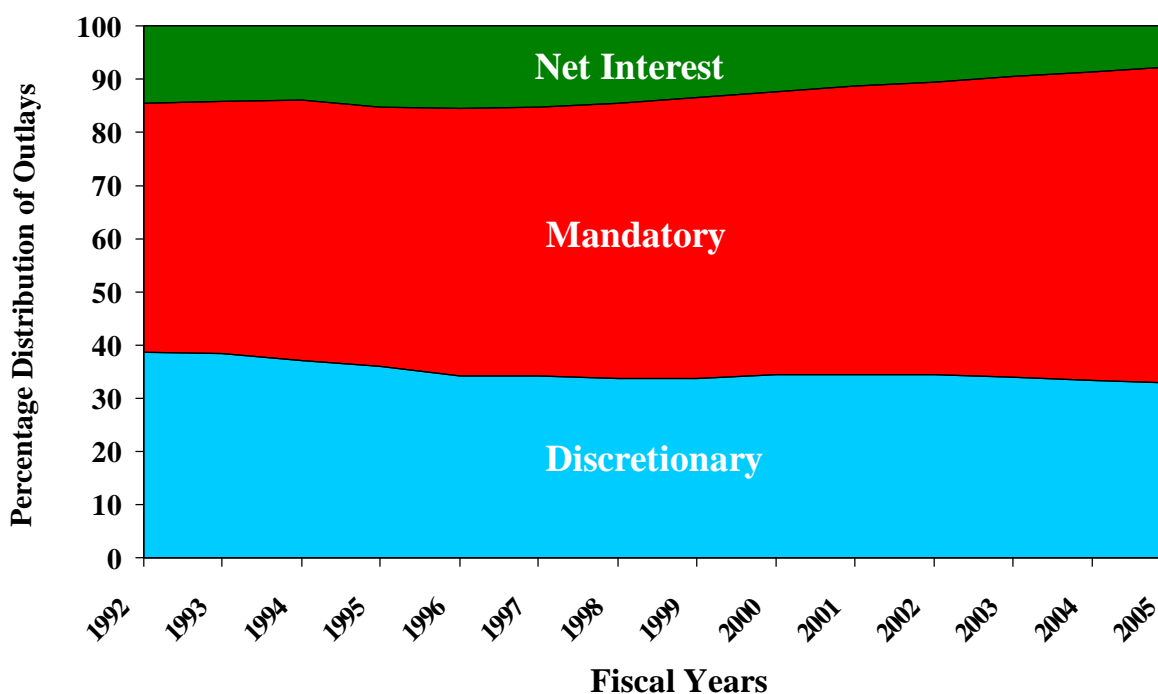


## VIEWES AND ESTIMATES OF THE COMMITTEE ON SCIENCE FOR FISCAL YEAR 2001

The Members of the Science Committee believe America's future preeminence in world affairs will be based more on economic strength than at any other time in our Nation's history. The robust economic strength that America enjoys today is a result of pioneering fundamental research and development activities of the not-too-distant past. Similarly, today's science, technology, and engineering base will improve the quality of life for future generations of citizens and will enable them to look back at this era and see it as the second "golden-age" of science.

Fiscal discipline at the Federal level has resulted in projections of budget surpluses well into the future. Continuing pressure from mandatory programs, however, will continue to squeeze discretionary funding.

**Comparison of Mandatory, Discretionary and Net Interest Outlays  
Under President Clinton's Budgets  
(Actual Dollars, FY 1992-FY 2005)**

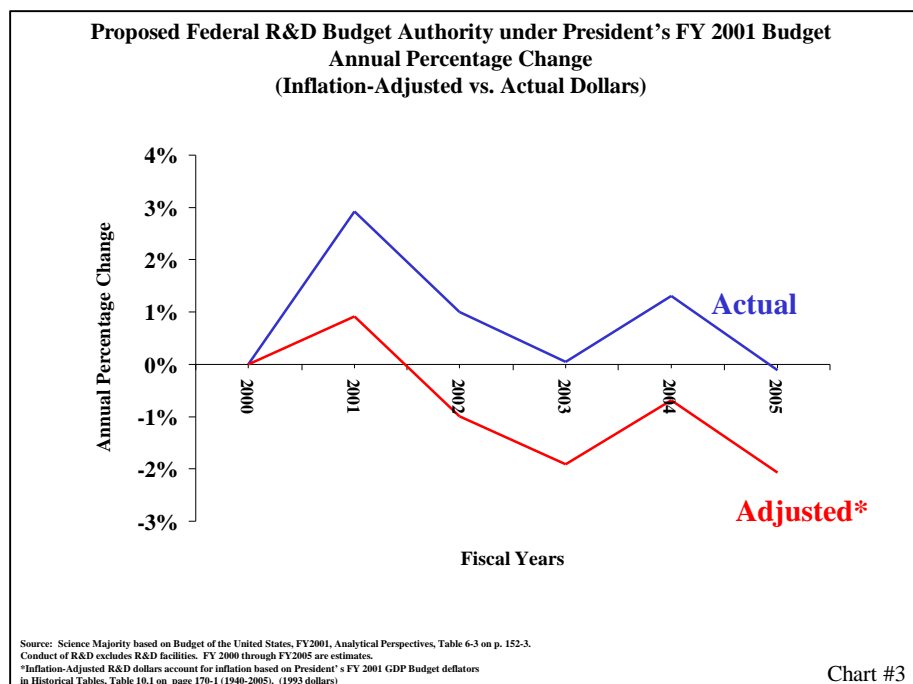
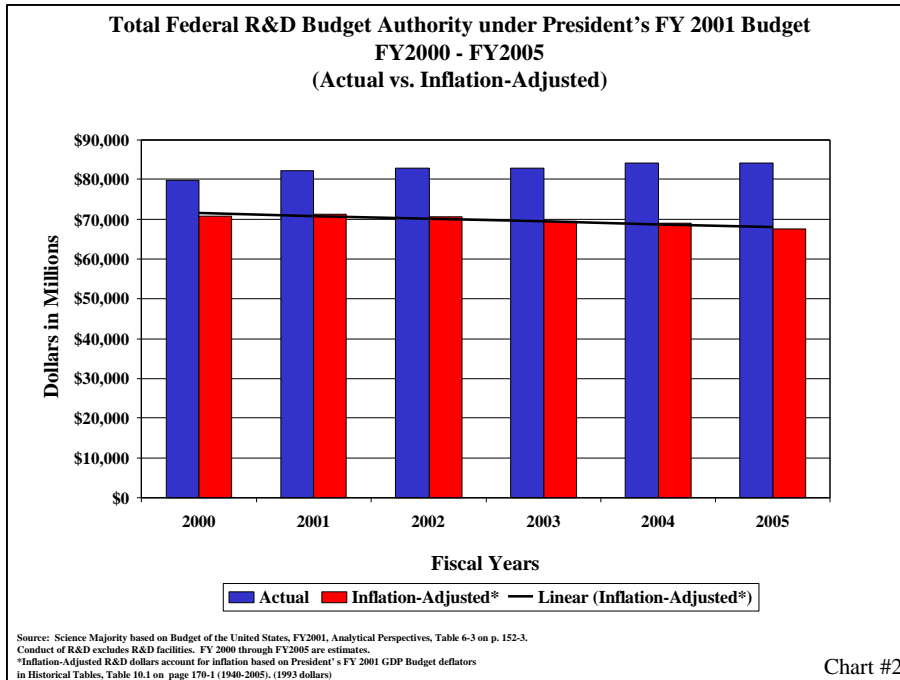


Source: Science Majority, based on the Budget of the United States, FY 2001, Historical Tables, Table 8.3  
Fiscal Years 2000-2005 are estimates

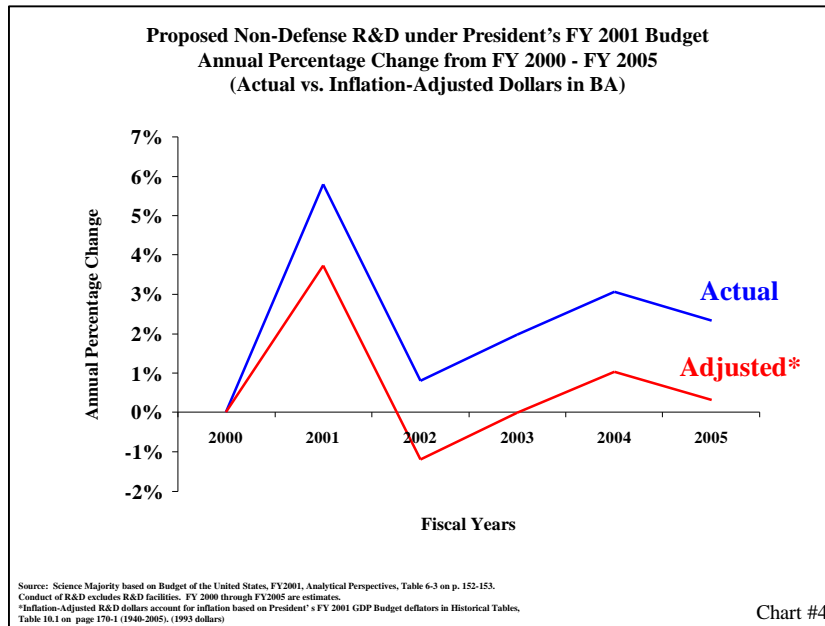
Chart #1

In FY2000, Congress affirmed the strong correlation between scientific advance and a growing economy by making discretionary R&D spending a priority. The American Association for the Advancement of Science (AAAS) notes that total federal support for total R&D in the FY2000 budget reached \$83.3 billion last year, an increase of 5.0 percent over FY1999. Programs under the Science Committee's jurisdiction received an increase in FY2000 of 3.2 percent, or \$798 million more than appropriated in FY1999.

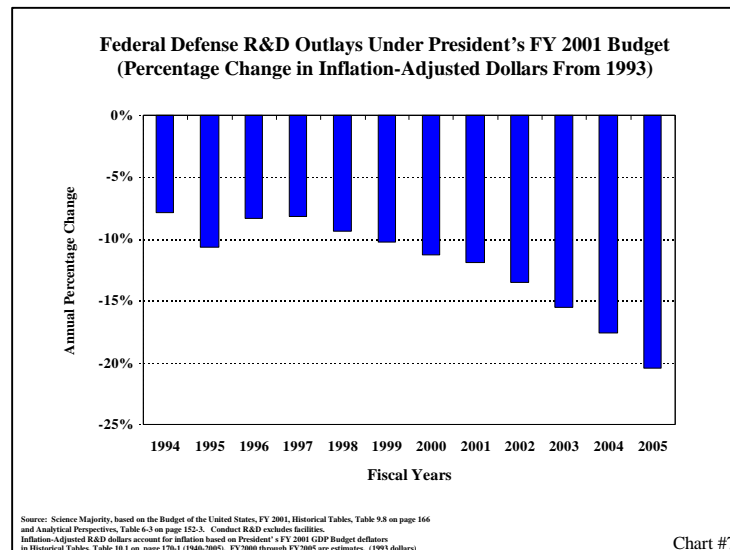
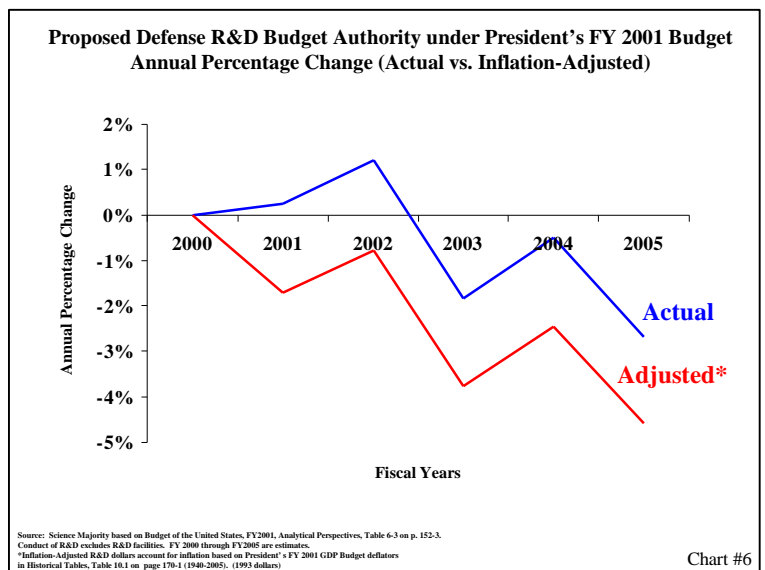
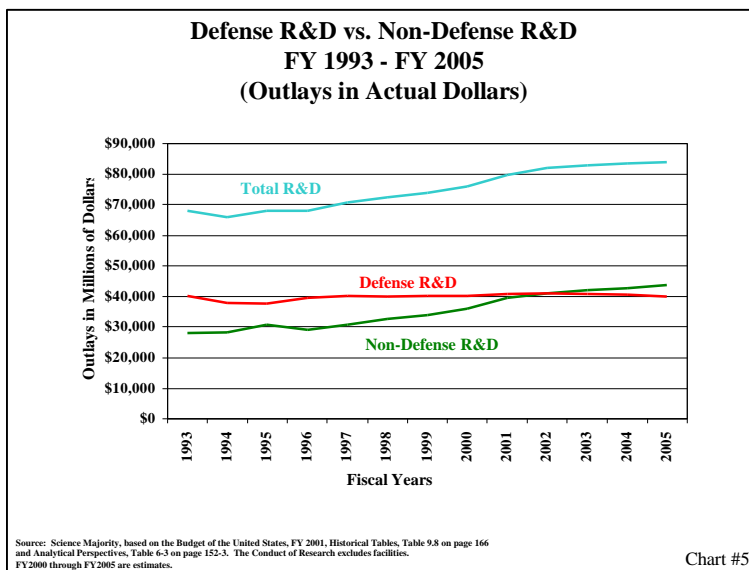
The President's FY2001 science budget outlines some positive steps in strengthening our scientific enterprise and many of the new initiatives parallel the Committee's work. The President has proposed a 3 percent increase for total R&D in FY2001 actual dollars. Non-Defense R&D receives a significant increase of 6 percent in FY2001 in actual dollars under the President's budget. Despite those significant increases in FY2001, outyear budgets are either flat or actually decline. The President's budget fails to meet the stable and sustainable funding criteria needed for science and technology programs in the outyears.



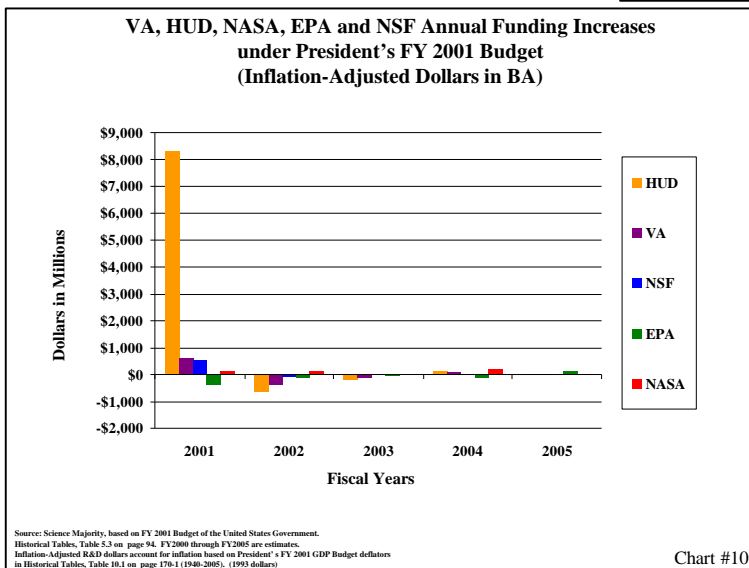
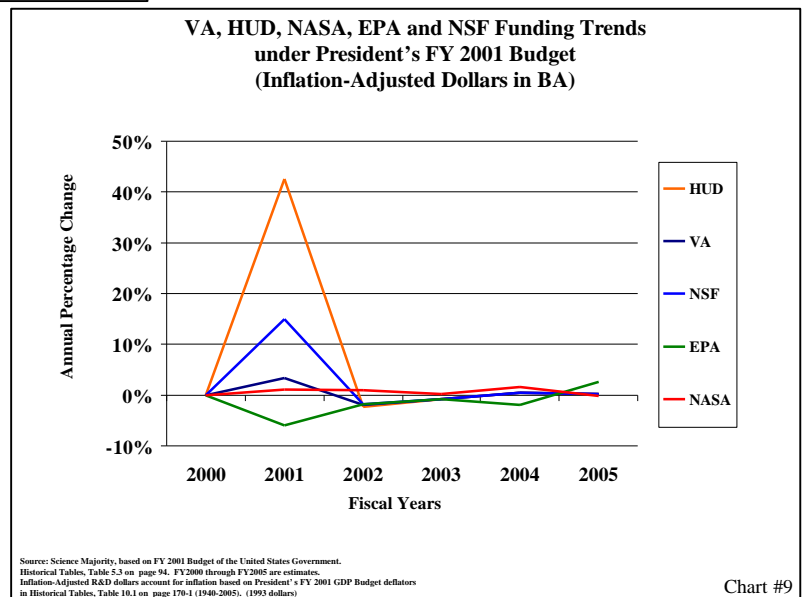
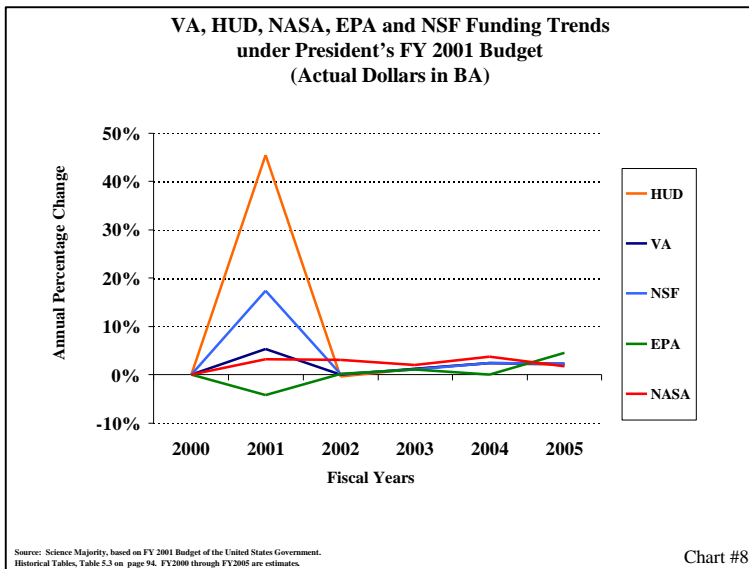
While Civilian R&D would receive a 6 percent funding increase in FY2001 actual dollars, the President's FY2001 budget growth drops below the rate of inflation in funding in FY2002.



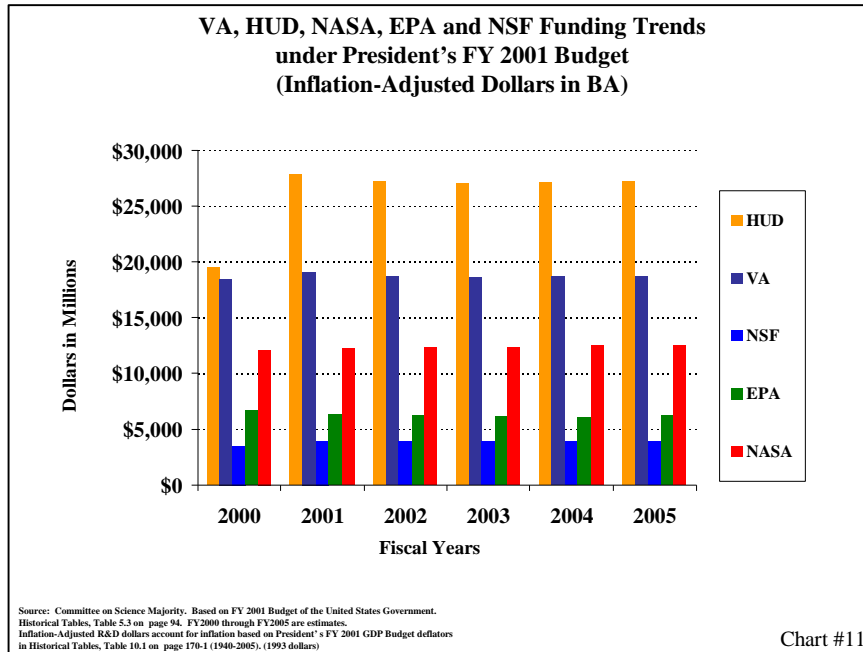
In addition, the President's FY2001 budget continues to decrease Defense R&D.



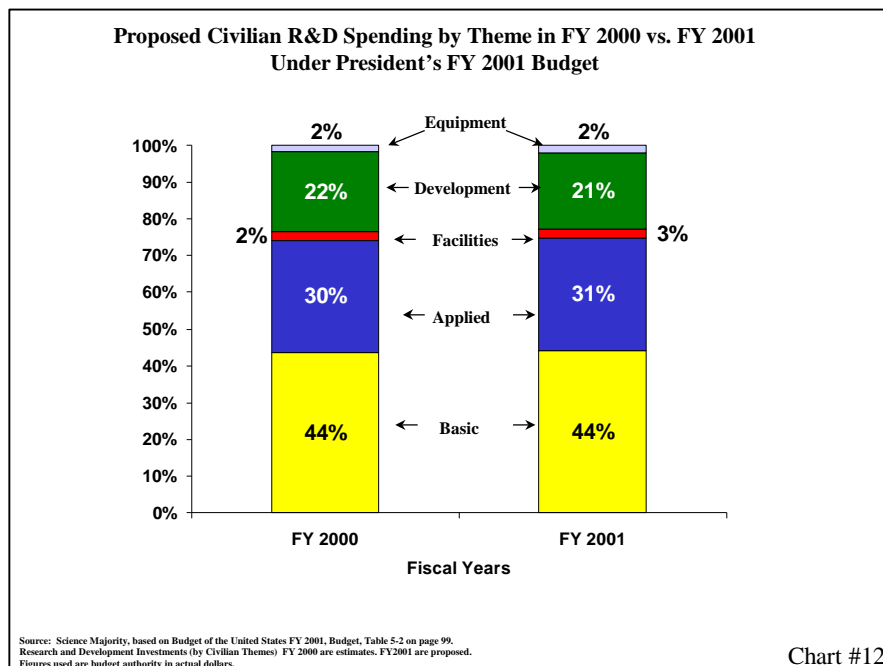
As stated, the President's FY2001 budget would provide an increase for civilian science agencies and departments. However, the President also provides large increases for competing programs within VA, HUD and Independent Agencies.



While science has a great impact on our economy and future, science programs will have to continue to demonstrate their importance versus other discretionary spending programs. Most of the Committee's science programs fall under the VA, HUD and Independent Agencies appropriations account. The budgets of NASA, EPA and NSF are dwarfed by other accounts in this appropriation bill.



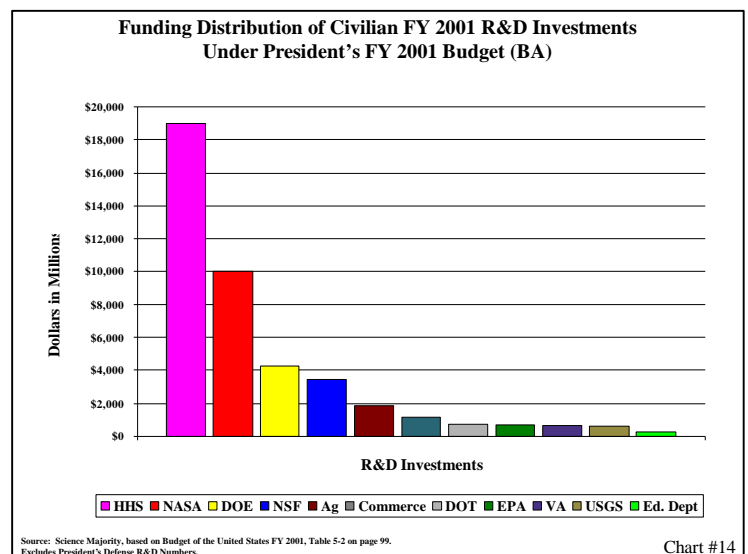
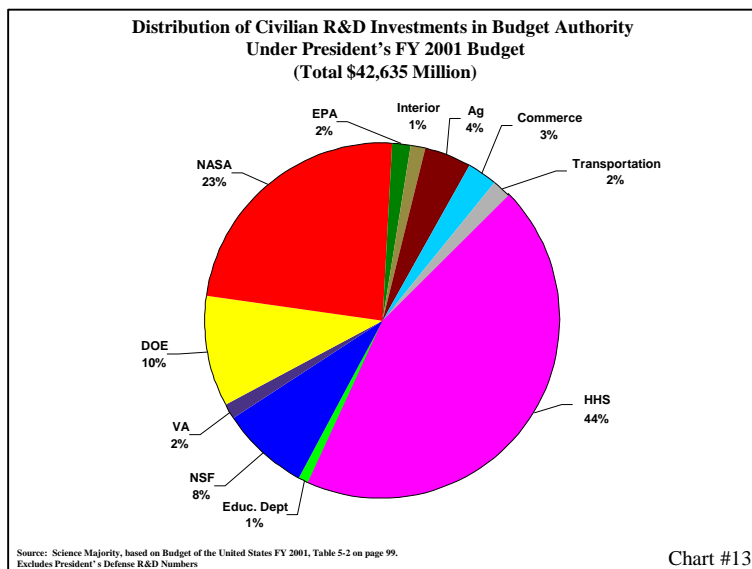
The National Science Policy Study of 1998 recognizes, “[t]he resources of the federal government will always be limited in that there are always greater numbers of worthwhile projects than there are dollars in the treasury to fund them.” In order to maximize every science dollar, it is the view of the Committee on Science that funding for fundamental scientific research should take precedence over applied research that is better conducted by the private sector. The Study emphasized that the Federal Government must make basic research the federal research priority. In his FY2001 budget, the President also pledges to make long-term basic research a priority. It is true that basic research receives an increase over FY2000 in the President's FY2001 budget, but so does almost every other program. Thus, the Science Committee believes a more accurate depiction of the President's priority in science is illustrated in the distribution of funding between applied and basic research. This comparison of FY2000 and FY2001 civilian R&D spending by theme demonstrates that the Administration's stated emphasis on basic research is not reflected in the FY2001 budget.



To maintain fiscal discipline while at the same time funding key scientific initiatives, the Committee on Science supports funding increases above the rate of inflation for civilian research and development programs for those programs that adhere to the following principles:

1. Federal R&D must focus on programs that are long-term, high-risk, non-commercial, and well-managed;
2. Federal R&D should adhere to agency missions and be open to rigorous evaluations of quality and results;
3. Federal R&D should not focus on technical feasibility or research providing incremental improvements in a product or process design, or associated with marketing and commercialization. These types of research should be left to the private sector;
4. Science partnerships should be encouraged to leverage scarce taxpayer dollars. However, the terms of these partnerships should be clear and the roles and responsibilities of the parties involved well defined; and
5. Federal R&D infrastructure needs to be prioritized in a manner consistent with R&D program requirements.

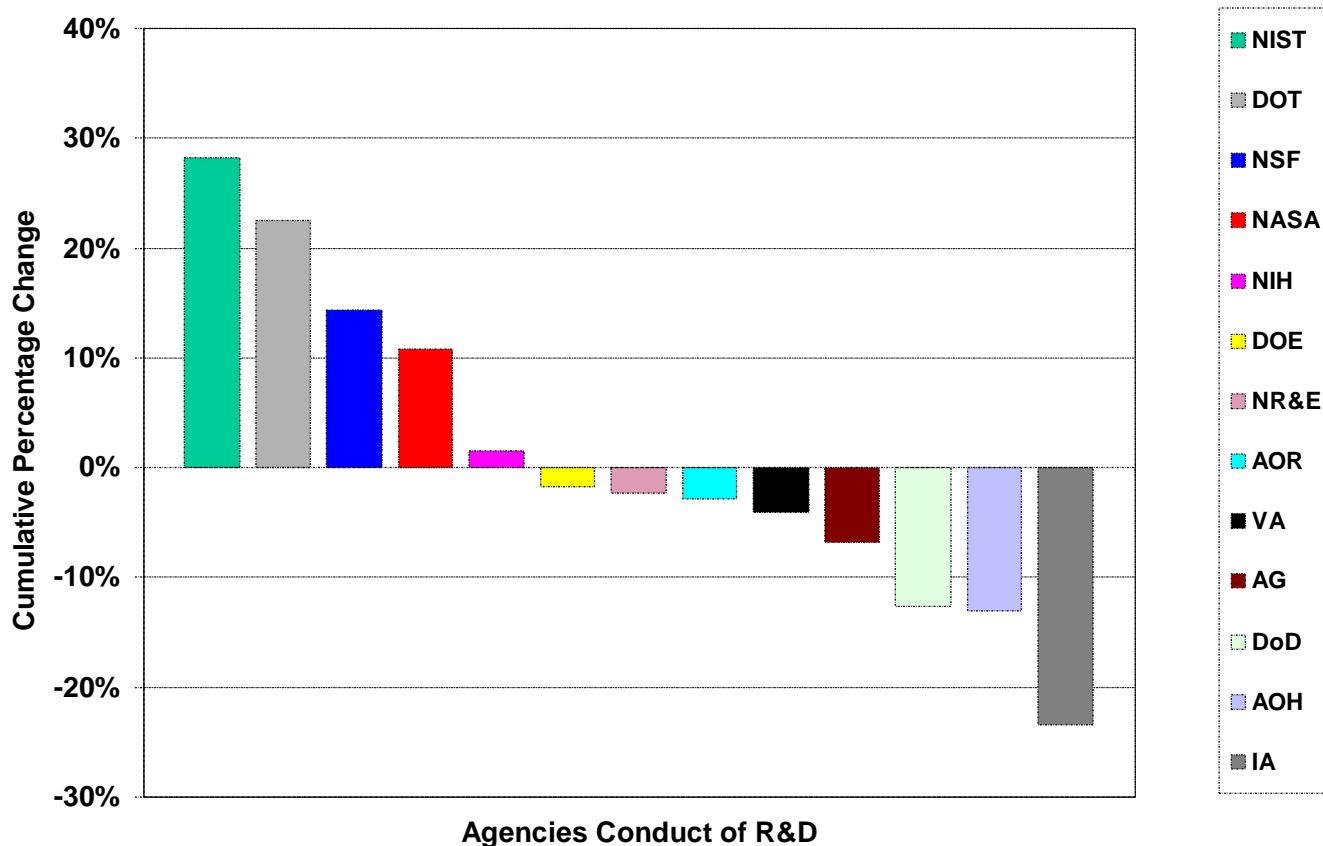
As a result of most R&D programs receiving increases, a way to evaluate the President's FY2001 R&D priorities is to examine the funding distribution for civilian R&D investments. The Department of Health and Human Services continues to be the President's FY2001 budget priority.



The Committee supports increases in biomedical research. These increases, however, must be accompanied by balanced increases in other research accounts. Success in biomedical research is achieved through advances in basic research across all disciplines of science. The contributions of computer science, physics, mathematics, engineering and other fields to biomedical research illustrate the need to secure funding for fundamental science as part of the Federal Government's overall research agenda.

When viewing percentage increases for the conduct of R&D under the President's FY2001 budget, many of the agencies under the Science Committee's jurisdiction fare well compared to other R&D programs.

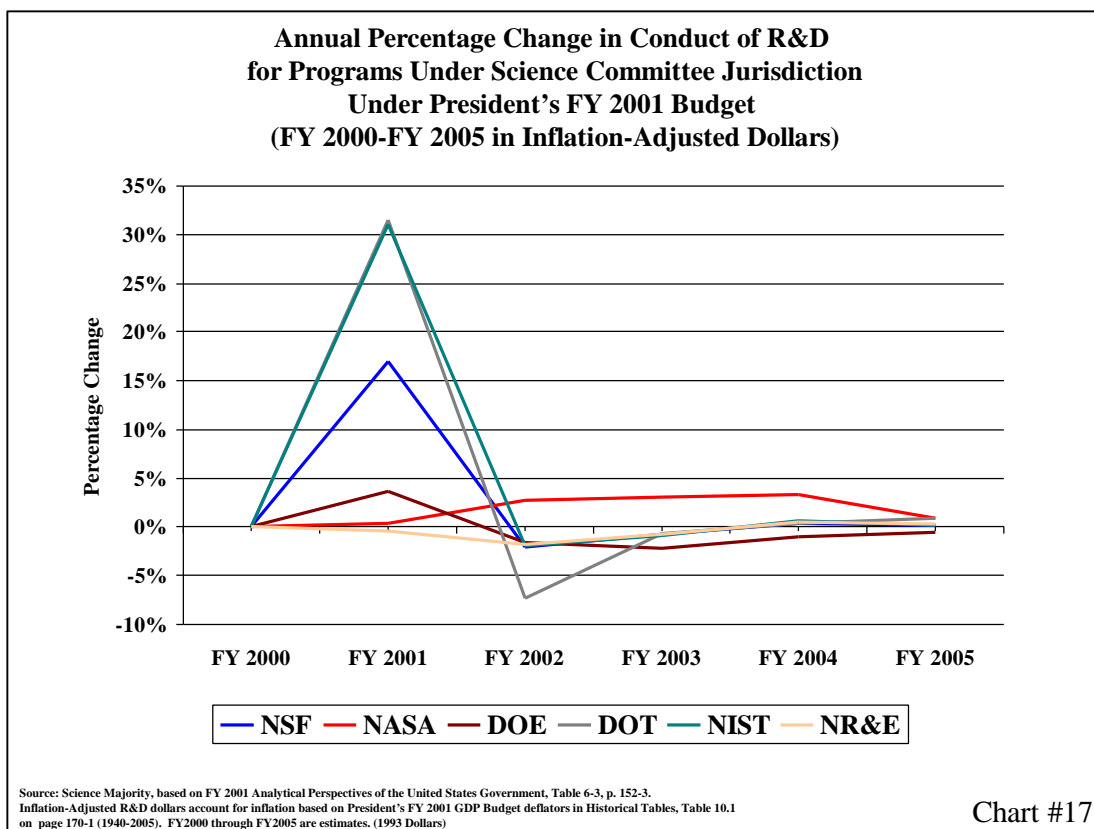
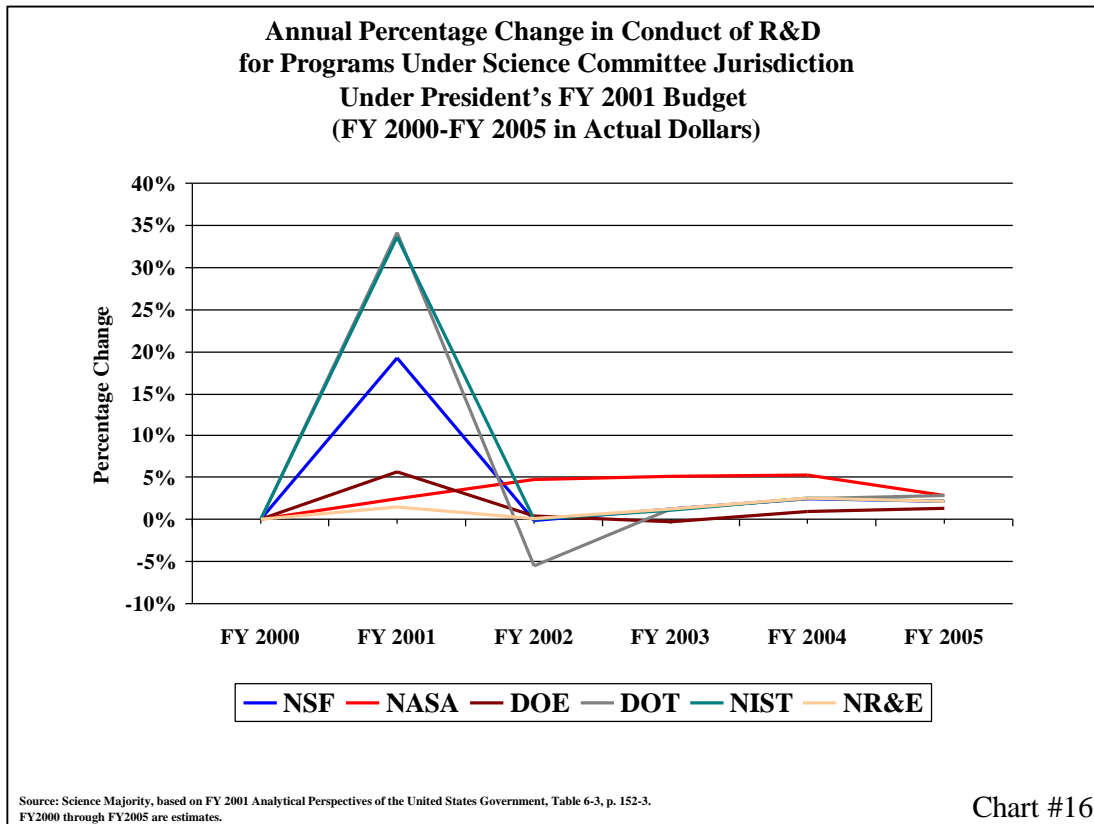
**Percentage Change of R&D Funding from FY 2000 to FY 2005  
Under President's FY 2001 Budget (Inflation-Adjusted Dollars)**



Source: Science Majority, based on Budget of the United States, FY 2001, Analytical Perspectives, Table 6-3 on p. 152-3.  
Conduct of R&D-- excludes R&D facilities. Percentages represent change in adjusted dollars 2000-2005.  
Inflation-Adjusted R&D dollars account for inflation based on President's FY 2001 GDP Budget deflators  
in Historical Tables, Table 10.1 on page 170-1 (1940-2005). FY2000 through FY2005 are estimates. (1993 dollars)

**Chart #15**

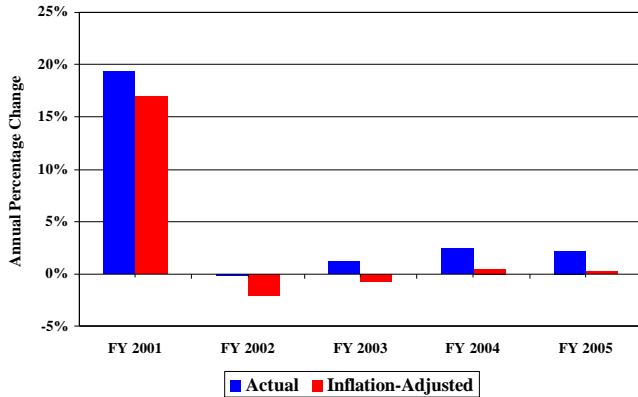
However, the Committee is concerned that all the growth appears in FY2001, with little or no commitment for other agencies' R&D outyear requirements.





While the conduct of R&D at the National Science Foundation (NSF), the Department of Transportation (DOT) and Department of Commerce (DOC) would receive substantial increased funding in FY2001 under the President's budget proposal, they would be cut or frozen in actual and adjusted dollars from FY2002 through FY2005.

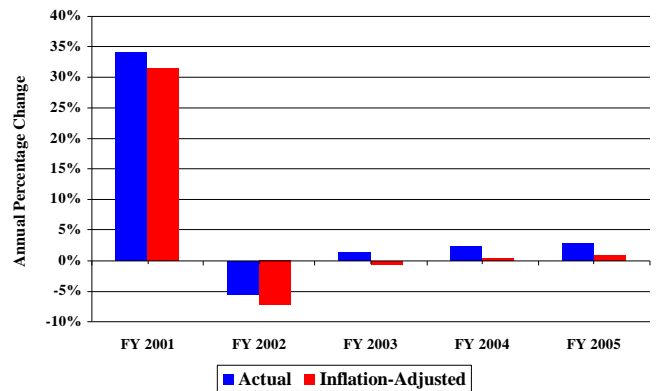
**National Science Foundation Conduct of R&D**  
Annual Percentage Change Under President's FY 2001 Budget  
FY 2000-FY 2005  
(Actual and Inflation-Adjusted)



Source: Science Majority, based on FY 2001 Analytical Perspectives of the United States Government, Table 6-3, p. 152-3.  
Inflation-Adjusted R&D dollars account for inflation based on President's FY 2001 GDP Budget deflators in Historical Tables, Table 10.1 on page 170-1 (1940-2005). FY 2000 through FY 2005 are estimates. (1993 Dollars)

Chart #18

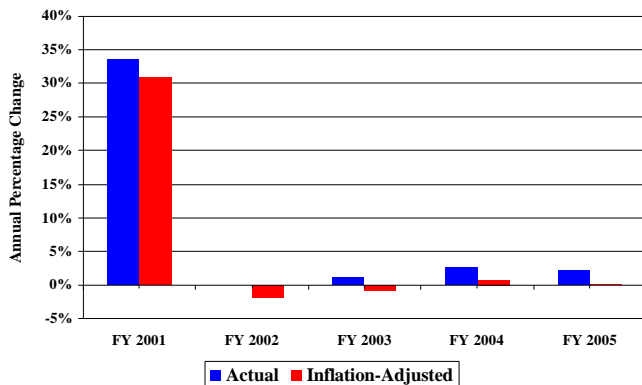
**Department of Transportation Conduct of R&D**  
Annual Percentage Change Under President's FY 2001 Budget  
FY 2000-FY 2005  
(Actual and Inflation-Adjusted)



Source: Science Majority, based on FY 2001 Analytical Perspectives of the United States Government, Table 6-3, p. 152-3.  
Inflation-Adjusted R&D dollars account for inflation based on President's FY 2001 GDP Budget deflators in Historical Tables, Table 10.1 on page 170-1 (1940-2005). FY 2000 through FY 2005 are estimates. (1993 Dollars)

Chart #19

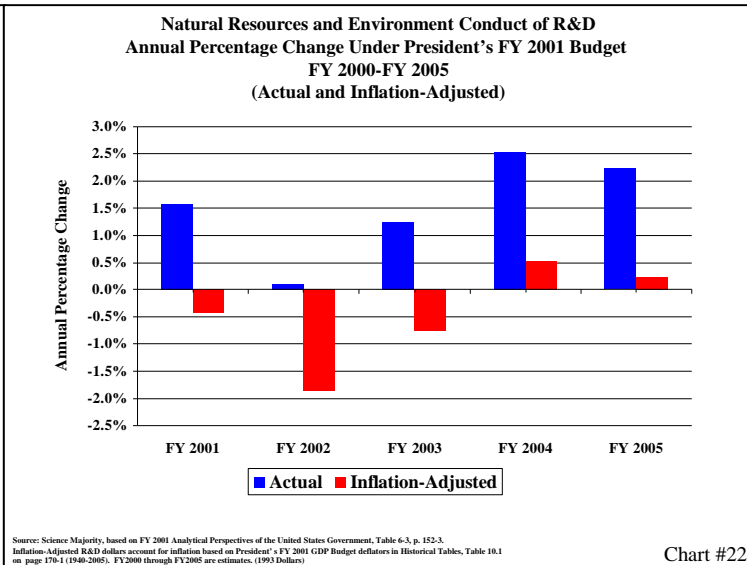
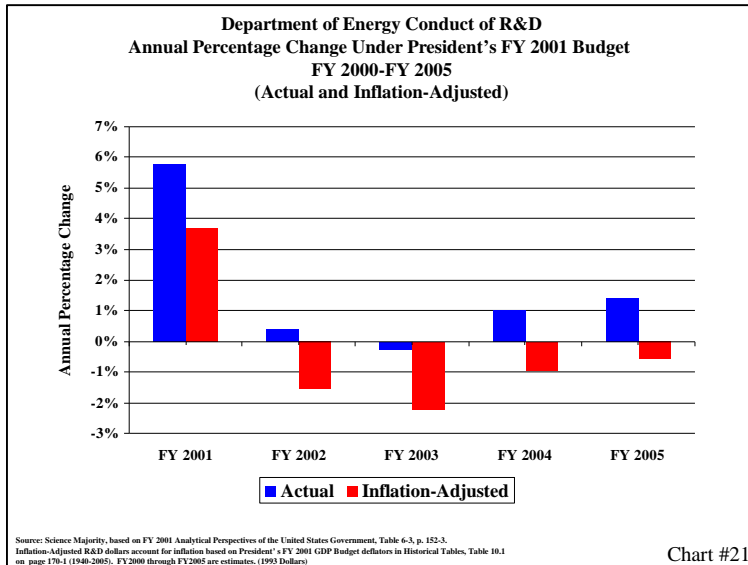
**Department of Commerce (NIST) Conduct of R&D**  
Annual Percentage Change Under President's FY 2001 Budget  
FY 2000-FY 2005  
(Actual and Inflation-Adjusted)



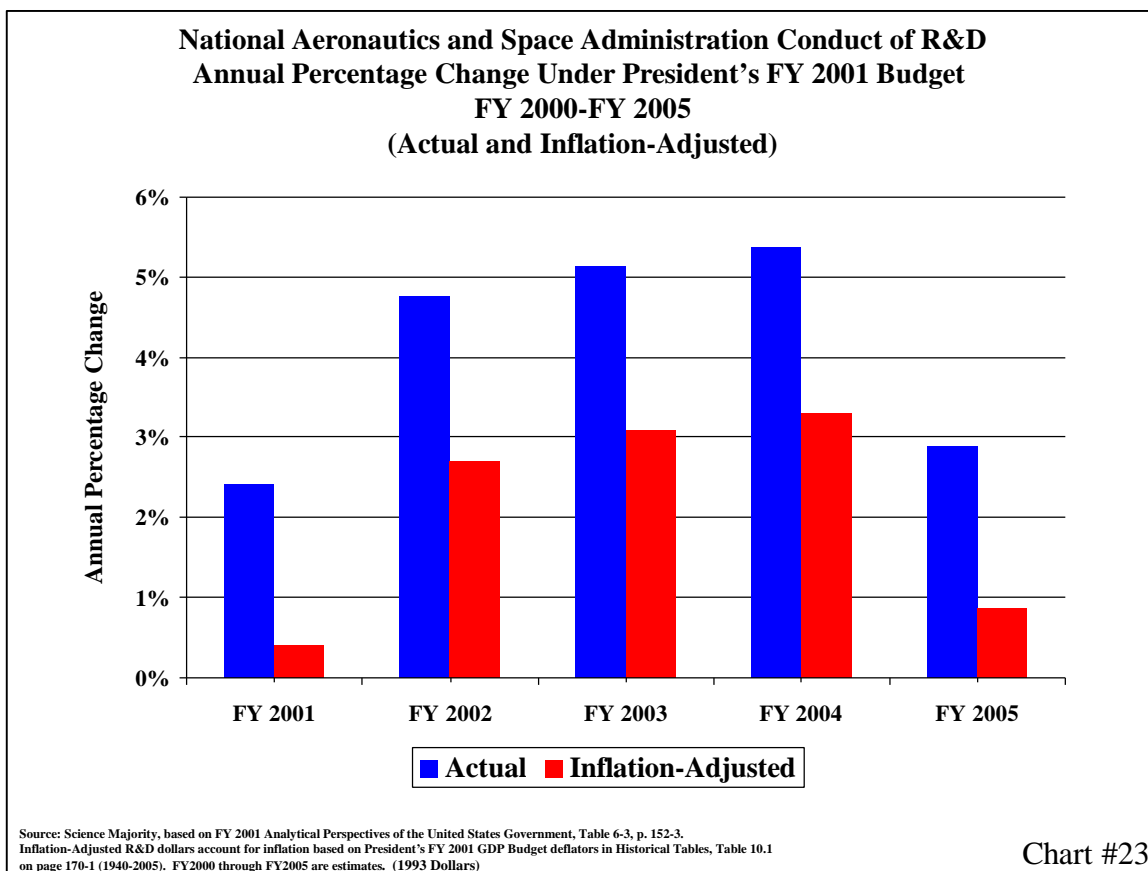
Source: Science Majority, based on FY 2001 Analytical Perspectives of the United States Government, Table 6-3, p. 152-3.  
Inflation-Adjusted R&D dollars account for inflation based on President's FY 2001 GDP Budget deflators in Historical Tables, Table 10.1 on page 170-1 (1940-2005). FY 2000 through FY 2005 are estimates. (1993 Dollars)

Chart #20

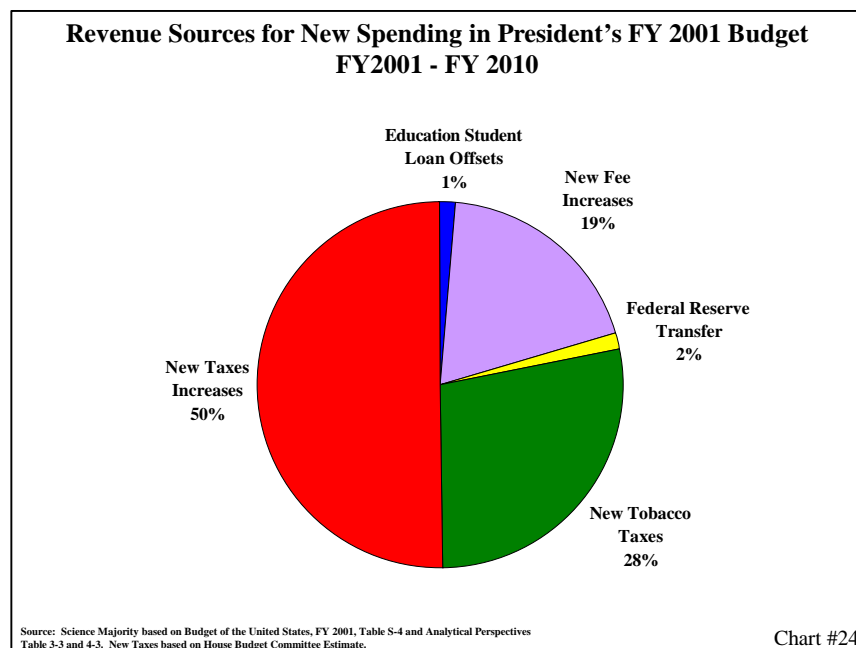
The conduct of R&D at the Department of Energy (DOE) would receive a 5.8 percent increase in FY2001 while programs under the Natural Resources and Environment category would receive a more modest 1.6 percent increase in FY2001. In actual dollars, however, spending would fall below the rate of inflation for FY2002. This trend continues for DOE through FY2005.



The National Aeronautics and Space Administration (NASA) appears to be the only agency within the Science Committee's jurisdiction that receives stable and sustainable funding for the 5 year run-out in the Administration's FY2001 budget request. The Committee is pleased that after years of declining NASA budget requests the NASA budget is stabilizing.



Finally, the Committee is concerned that the President's budget is based on uncertain and unlikely revenue sources. The Committee hopes that discretionary science programs do not suffer as a result of revenues that are unlikely to materialize.



We urge the Committee on the Budget to provide sufficient funding to meet the authorizations approved by the Science Committee. The Committee has set out its priorities in authorizations for programs under its jurisdiction.

They are:

H.R. 1184: To authorize appropriations for carrying out the Earthquake Hazards Reduction Act of 1977 for FY2000 and FY2001, and for other purposes.

H.R. 1550: To authorize appropriations for the United States Fire Administration for FY2000 and FY2001, and for other purposes.

H.R. 1551: To authorize the Federal Aviation Administration's civil aviation research and development programs for FY2000 and FY2001, and for other purposes.

H.R. 1552: Marine Research and Related Environmental Research and Development Programs Authorization Act of 1999.

H.R. 1553: To authorize appropriations for FY2000 and FY2001 for the National Weather Service, Atmospheric Research, and National Environmental Satellite, Data and Information Service activities of the National Oceanic and Atmospheric Administration, and for other purposes.

H.R. 1654: To authorize appropriations for the National Aeronautics and Space Administration for FY2000, FY2001, and FY2002, and for other purposes.

H.R. 1655: To authorize appropriations for FY2000 and FY2001 for the civilian energy and scientific research, development, and demonstration and related commercial application of energy technology programs, projects, and activities of the Department of Energy, and for other purposes.

H.R. 1656: To authorize appropriations for FY2000 and FY2001 for the commercial application of energy technology and related civilian energy and scientific programs, projects, and activities of the Department of Energy, and for other purposes.

H.R. 1742: To authorize appropriations for FY2000 and FY2001 for the environmental and scientific research, development, and demonstration programs, projects, and activities of the Office of Research and Development and Science Advisory Board of the Environmental Protection Agency, and for other purposes.

H.R. 1743: To authorize appropriations for FY2000 and FY2001 for the environmental and scientific and energy research, development, and demonstration and commercial application of energy technology programs, projects, and activities of the Office of Air and Radiation of the Environmental Protection Agency, and for other purposes.

H.R. 1744: To authorize appropriations for the National Institute of Standards and Technology for FY2000 and FY2001, and for other purposes.

H.R. 1273 (P.L. 105-207): A bill to authorize appropriations for FY1998 and FY1999 for the National Science Foundation, and for other purposes.

The FY2001 Views and Estimates for programs within the jurisdiction of the Committee on Science are contained in the following pages.

## **COMMITTEE ON SCIENCE**

### ***INFORMATION TECHNOLOGY RESEARCH AND DEVELOPMENT***

The United States stands as the global leader in computing, communication and information technology. This \$500 billion-a-year industry accounted for one-third of our Nation's economic growth since 1992 and created new industries and millions of new, high-paying jobs. This staggering success, however, is predicated on Federal research conducted over the last three decades.

Fundamental IT research played an essential role in the Information Revolution. However, maintaining the Nation's global leadership in information technology is not a given. The congressionally chartered President's Information Technology Advisory Committee (PITAC) stated that the "current boom in information technology is built on basic research in computer science carried out more than a decade ago. There is an urgent need to replenish the knowledge base." Although the private sector conducts most of the IT research, that spending has focused on short-term applied work. As the Nation's economy becomes more dependent on the Internet and IT in general, current federal programs and support for fundamental research in IT must be revitalized.

By a vote of 41-0, the Science Committee passed H.R. 2086, the Networking and Information Technology Research and Development Act (NITRD), a five-year authorization bill in September of 1999. The House passed the bill by voice vote on February 15, 2000.

H.R. 2086 provides comprehensive authorization for the Federal Government's civilian basic information technology research effort at the six agencies under the Science Committee's jurisdiction: NSF, NASA, DOE, National Institute of Standards and Technology (NIST), National Oceanic and Atmospheric Administration (NOAA), and Environmental Protection Agency (EPA).

This bill fundamentally will alter and greatly enhance the way information technology research is supported and conducted. Its centerpiece is the Networking and Information Technology Research and Development program, which will be managed primarily through NSF and will focus on long-term, peer-reviewed basic research of the kind in which NSF excels.

While funding for individual investigators remains an important aspect of IT research, funding for research teams and centers also can lead to dramatic progress. Therefore in FY2001, the bill authorizes \$25 million

for large grants of up to \$1 million for high-end computing, software, and networking research and \$45 million for information technology research centers that are comprised of research teams of six or more members.

To attract more students to science and to careers in IT, the bill also authorizes \$95 million for universities to establish for-credit internship programs for IT-related research at private high-tech companies. Both two- and four-year schools will be eligible for these grants, which will operate on a 50-50 cost sharing basis.

To help meet the need for state-of-the-art computing systems for the civilian research community in FY2001, H.R. 2086 authorizes \$70 million for a terascale computing competition at NSF. The bill requires that the funds be allocated on a competitive, peer-reviewed basis, and that awardees be required to connect to the Partnership for Advanced Computational Infrastructure (PACI) network.

The bill also authorizes the Next Generation Internet program through completion in FY2002.

Our future global influence lies in the hands of our young people, the education and training they receive, and the new scientific breakthroughs they produce. H.R. 2086 combines increased authorizations for research funding with important policy changes that will keep the Nation at the cutting edge of information technology and produce the next generation of highly skilled IT workers. It offers opportunities for all by providing open competition for IT grant funding, as well as benefiting diverse groups ranging from two-year community colleges to the largest universities.

This bipartisan legislation demonstrates a commitment to upholding our Nation's preeminence in information technology. It has been endorsed by dozens of organizations including the 1999 co-chairs Bill Joy and Ken Kennedy of PITAC, the Technology Network, the Computing Research Association, the Big Ten Universities and the U.S. Chamber of Commerce.

During consideration of the bill on the House floor, the House adopted an amendment by Congressman Capuano to reduce funding for DOE's High Performance Computing and Communication (HPCC) program and transfer the funding to NSF. The Committee supports this prioritization of NSF basic research and encourages the Committee on Budget to reallocate funding accordingly.

#### *RESEARCH AND DEVELOPMENT TAX CREDIT*

The Science Committee continues to support the National Science Policy Study goal to permanently extend the R&D Tax Credit to create a stable R&D planning foundation for private industry. The Committee believes that last year's five-year extension of the R&D credit is a positive step in this endeavor.

#### *GOVERNMENT PERFORMANCE AND RESULTS ACT (Results Act)*

Each year, American taxpayers invest billions of federal funds in civilian science agencies and programs. Rightly so, the American people are demanding that these funds be spent in a more efficient and businesslike manner. While the Nation has entered an era of projected federal budget surpluses, this does not justify wasteful inefficient management and spending for federal programs. We must continue to strive for good government, meaning efficient, effective and well managed programs. The Government Performance and Results Act aims to implement these principles in agencies practice.

The Government Performance and Results Act (the Results Act) continues to provide an effective oversight tool for the Science Committee to reexamine the value and effectiveness of science programs and legislate the necessary corrective measures to these programs. By Congress requiring agencies to adopt new planning, budgeting and reporting procedures, government agencies and programs should become more efficient, effective and accountable to the American taxpayer.

For science, in particular, "the application of the Results Act to federal science projects must not result in a lost of efficiency by overwhelming scientists with burdensome bureaucratic obligations and distracting them from their research efforts,"<sup>1</sup> as the National Science Policy Study pointed out. There is a distinction,

however, between high quality research and low quality research, and that distinction is be measurable. For example, the National Academy of Sciences' Committee on Science, Engineering, and Public Policy (COSEPUP) study included a roadmap for establishing useful measures for basic research. Moreover, as the Science Policy Study stated, "[s]cience often takes unexpected turns and researchers must be able to follow these unanticipated bends in the road to follow new, potentially more rewarding paths."<sup>2</sup> As the COSEPUP study and the National Science Policy Study noted, scientists must be involved in the Results Act process in order to follow a roadmap to successfully implement the Results Act for science programs.

## **SUBCOMMITTEE ON BASIC RESEARCH**

It is the Committee's view that supporting basic research, including math, science, and engineering education, is a proper role of government. In particular, the Committee has supported large funding increases for the National Science Foundation (NSF) and will support further increases consistent with fiscal realities. The Committee also will continue to support education programs at NSF and will work with the agency to promote a sound education research agenda that will provide the foundation for improved student performance in science and math. In particular, the Committee will abide by the broad recommendations in the National Science Policy Study to improve United States performance in K-12 science and math. The Committee's education agenda will work to ensure education reforms have a solid intellectual footing.

The Committee further notes the importance of basic research to agency missions. To that end, the Committee will continue to support science programs that help protect life and property. The Science Committee has many programs and agencies under its jurisdiction that support such missions, including two under the Basic Research Subcommittee: the U.S. Fire Administration and the National Earthquake Hazards Reduction Program. With proper funding and management, these and other programs can have a tangible, beneficial impact on the lives of the Nation's citizens.

### *NATIONAL SCIENCE FOUNDATION (NSF)*

NSF funds about 19,000 projects in research, engineering, and education, mostly through competitive, peer-reviewed grants and cooperative agreements, to more than 2,000 universities, colleges, K-12 schools, businesses, and other research institutions throughout the United States. Although its budget level falls well below the National Institutes of Health and other agencies that support science, the role of NSF in promoting basic research is extremely important to the U.S. scientific enterprise. For example, about 25 percent of the federal dollars earmarked for basic research in academia is provided through NSF, as well as nearly 50 percent of the funding for non-medical university research. The Foundation also participates in international science projects.

For FY2001, the Administration has requested \$4.60 billion for NSF, which includes approximately \$31.0 million from the H-1B immigration fees. This represents a 17.1 percent increase over the FY2000 appropriation of \$3.93 billion. Included in this proposal are initiatives for information technology research (up 160 percent to \$327 million), nanotechnology (up 123 percent to \$217 million), biocomplexity in the environment (up 173 percent to \$136 million), and the 21<sup>st</sup> century workforce (up 113 percent to \$157 million.)

As the current authorization for NSF (P.L. 105-207) expires at the end of FY2000, the Committee will be taking up a reauthorization bill in the coming months. The Committee supports the increased funding requested for NSF and is pleased the Administration recognizes the importance of funding basic research. However, it is concerned that the increase for FY2001 may amount to a one-time funding bump, as the out-year estimates provided by the Administration suggest. The Committee believes that science funding should not move in fits and starts, and it hopes that future Administrations can improve on the out-year projections provided in the current budget proposal.

## *FEDERAL EMERGENCY MANAGEMENT AGENCY - UNITED STATES FIRE ADMINISTRATION (USFA)*

Programs under the U.S. Fire Administration (USFA), which includes the National Fire Academy, support public education activities in fire safety, prevention, and control; data collection, analysis, and distribution; fire suppression research and development; arson prevention; and firefighter health and safety. The agency also supports a memorial for fallen firefighters. Over the years, USFA has been credited with helping to reduce loss of life of both firefighters and civilians.

In the First Session, the Committee passed H.R. 1550, the Fire Administration Authorization Act of 1999, through the House. H.R. 1550 authorizes \$49.5 million for FY2001 for USFA activities. The President's FY2001 request for base programs at USFA is \$44.8 million, up 4.1 percent from the FY2000 appropriated level, but 9.6 percent below the \$49.5 million authorized for FY2001 in H.R. 1550.

In addition, the Administration is proposing a \$25 million pilot grant program to provide health and safety firefighter equipment in needy communities. There are a number of questions that need to be answered about this program, including whether or not USFA is the appropriate agency to administer it, particularly in light of recent concerns about how the agency is managed. The Committee recognizes the valuable contribution first responders make to their communities, and it will continue to work to ensure the effectiveness of the USFA programs on which volunteer and professional firefighters rely for training, research, public education, and other services.

## *NATIONAL EARTHQUAKE HAZARDS REDUCTION PROGRAM (NEHRP)*

NEHRP's research and mitigation activities have the potential to reduce greatly the earthquake hazard risk in many parts of the country. Four agencies participate in NEHRP: the Federal Emergency Management Agency (FEMA), which directs earthquake planning and mitigation programs; NSF, which supports fundamental geological and engineering research; United States Geological Survey (USGS), which conducts research on earthquake hazards potential, earthquake effects, and post-earthquake phenomena; and National Institute of Standards of Technology (NIST), which is involved in developing building standards.

H.R. 1184, the Earthquakes Hazards Reduction Authorization Act of 1999, which passed the House during the First Session, authorizes \$174.8 million for the program, including an authorization of \$44 million for the Advanced National Seismic Research and Monitoring System at USGS and \$28.2 million for the Network for Earthquake Engineering Simulation (NEES) at NSF.

For FY2000, the Administration has requested \$127.4 million for NEHRP, an increase of 24.2 percent from the FY2000 appropriation of \$102.6 million. Much of this increase is attributed to the NSF request for NEES, which would rise from \$7.7 million in FY2000 to \$28.2 million in FY2001, in keeping with the funding profile laid out in H.R. 1184. The Committee would have preferred to see additional money being made available for the Advanced Seismic System at USGS in the Administration's budget, but recognizes the \$2.6 million in added funding for this project is a step in the right direction.

## **SUBCOMMITTEE ON ENERGY & ENVIRONMENT**

### *DEPARTMENT OF ENERGY (DOE)*

The Committee on Science has jurisdiction over DOE's civilian energy research, development, demonstration and commercial application of energy technology activities. DOE's FY2001 budget request proposes to fund these activities through six appropriations accounts: Science, Energy Supply, Non-Defense Environmental Management, Fossil Energy R&D, Energy Conservation R&D, and Clean Coal Technology.

DOE's FY2001 budget authorization request for programs under the Committee's jurisdiction is \$5,156.5 million. This is an increase of \$463.4 million—or 9.9 percent—above the FY2000 appropriation of \$4,693.1 million and an increase of \$82.9 million—or 1.6 percent—above the comparable FY 2001 level of \$5,073.6 million authorized by P.L. 104-271 (Hydrogen Future Act of 1996), Section 10 of P.L. 105-388 (Energy

Conservation Reauthorization Act of 1998), the House-passed version of H.R. 1655 (DOE Research, Development, and Demonstration Authorization Act of 1999), the Committee on Science's reported version of H.R. 1656 (DOE Commercial Application of Energy Technology Authorization Act of 1999), and the House-passed version of H.R. 2086 (Networking and Information Technology Research and Development Act).

Increases over the FY2000 comparable appropriation include: (1) \$99.4 million, or 32.0 percent, for Solar and Renewable Resources Technologies; (2) \$11.7 million, or 4.8 percent, for Nuclear Energy; (3) \$2.0 million, or 5.1 percent, for Non-Defense Environment, Safety and Health; (4) \$10.9 million, or 1.5 percent for High Energy Physics; (5) \$14.1 million, or 4.0 percent, for Nuclear Physics; (6) \$11.2 million, or 2.6 percent, for Biological and Environmental Research; (7) \$236.3 million, or 30.3 percent, for Basic Energy Sciences; (8) \$54.1 million, or 42.3 percent, for Advanced Scientific Computing Research; (9) \$9.5 million, or 7.2 percent, for Science Program Direction; and (10) \$63.7 million, or 11.2 percent, for Energy Conservation R&D. Decreases from the FY2000 appropriation include: (1) \$0.5 million, or 0.2 percent, for Fusion Energy Sciences; (2) \$21.2 million, or 6.9 percent, for Non-Defense Environmental Management; and (3) \$28.4 million, or 7.0 percent, for Fossil Energy R&D.

Increases over the FY2001 comparable authorized levels include: (1) \$9.7 million, or 2.2 percent, for Biological and Environmental Research; (2) \$260.8 million, or 34.6 percent, for Basic Energy Sciences; and (3) \$80.3 million, or 79.0 percent, for Advanced Scientific Computing Research. Decreases from the FY2001 comparable authorized levels include: (1) \$37.8 million, or 8.5 percent, for Solar and Renewable Resources Technologies; (2) \$4.1 million, or 1.6 percent, for Nuclear Energy; (3) \$10.7 million, or 21.1 percent, for Non-Defense Environment, Safety and Health; (4) \$44.7 million, or 5.9 percent, for High Energy Physics; (5) \$14.0 million, or 3.7 percent, for Nuclear Physics; (7) \$30.9 million, or 11.1 percent, for Fusion Energy Sciences; (8) \$11.2 million, or 7.3 percent, for Science Program Direction; (9) \$27.1 million, or 8.7 percent, for Non-Defense Environmental Management; (10) \$61.8 million, or 14.1 percent, for Fossil Energy R&D; and (11) \$43.2 million, or 6.4 percent, for Energy Conservation R&D.

The Committee supports DOE funding levels authorized either by current law or by House-passed or Committee on Science-reported legislation, particularly for those programs that emphasize long-term, high-risk, high-quality R&D activities. The Committee also notes the need for enactment of the management reforms contained in H.R. 1655 and H.R. 1656 to address the numerous examples of mismanagement and waste in current DOE programs.

Last year, the Committee noted that one of its major concerns was the Spallation Neutron Source (SNS) project under construction at Oak Ridge National Laboratory. At that time, a technical review committee assembled by DOE's Office of Science had recommended that the project's management be strengthened and that its cost estimates be reexamined, indicating that the figures being used to estimate the current baseline SNS cost may no longer be reliable. Subsequent reviews by a DOE external independent review team and the U.S. General Accounting Office (GAO) echoed these findings. As a result, the Committee proposed, and the House adopted, legislation (H.R. 1655) that authorized limited SNS construction funds for FY2000 only and made the release of these funds contingent on a number of specific management actions. These requirements were also included in P.L. 106-60 (Energy and Water Development Appropriations Act, 2000) and the Committee is pleased to note that they have been met—including the enactment of a statute by the State of Tennessee that exempts the SNS from all Tennessee State and Use Taxes, an exemption that will save taxpayers \$28.3 million in the project's cost. Consequently, the Committee supports the FY2001 request of \$281.0 million—including \$261.9 million for construction and \$19.1 million for SNS R&D and related project costs. The Committee intends to continue to be vigilant in its oversight of the project.

The Committee is concerned about the overall health of DOE's Science programs—particularly its scientific facilities. The FY2001 requests for High Energy Physics, Nuclear Physics, and Fusion Energy Sciences are essentially flat or declining and fail to keep pace with the rate of inflation. As a consequence, many of the facilities supported by these programs—representing a multi-billion dollar investment by the taxpayers—will operate fewer hours in FY2001, including a more than 24 percent reduction in operating time of the Tevatron at Fermilab, a nearly 8 percent decline at Stanford Linear Accelerator Center, and a more than 22 percent



decline at the Alcator C-Mod fusion facility at MIT. In addition, the DOE Science budget is estimated to either decline or remain essentially flat for the next several fiscal years after the scheduled increases for SNS construction are taken into account. The Committee notes DOE's enthusiasm for building new facilities and its reluctance for providing adequate operating funds once they are built.

#### *ENVIRONMENTAL PROTECTION AGENCY (EPA) R&D*

The Committee on Science has or shares jurisdiction with the Committee on Commerce over EPA R&D programs that are funded in three separate appropriation accounts: (1) Environmental Programs and Management (Science Advisory Board and Climate Change Technology Initiative); (2) Science and Technology (including Superfund R&D, Leaking Underground Storage Tank (LUST) R&D, and Oil Spill Research); and (3) State and Tribal Assistance Grants (Clean Air Partnership Demonstration Fund).

The Agency's overall FY2001 request is \$919.9 million for these programs. This is an increase of \$200.8 million—or 27.9 percent—above the FY2000 appropriation of \$719.2 million and an increase of \$129.3 million—or 16.4 percent—above the FY2001 level of \$790.6 million authorized by Section 201 of P.L. 104-182 (Safe Drinking Water Act Amendments of 1996); the House-passed version of H.R. 2086 (Networking and Information Technology Research and Development Act); and Committee on Science's reported versions of H.R. 1742 (EPA Office of Research and Development and Science Advisory Board Authorization Act of 1999) and H.R. 1743 (Environmental Protection Agency Office of Air and Radiation Authorization Act of 1999).

Increases over the FY2000 appropriation include: (1) \$124.0 million, or 120.0 percent, for the Climate Change Technology Initiative (CCTI); and (2) \$85.0 million for a "Clean Air Partnership Demonstration Fund" under Section 103 of the Clean Air Act (Research, investigation, training, and other activities) "to fund projects that achieve innovative and early air pollution and greenhouse gas emission reductions." Decreases from the FY2000 appropriation include: (1) \$4.0 million, or 0.8 percent, for the EPA Office of Research and Development (ORD); and (2) \$4.4 million, or 5.5 percent, for the EPA Office of Air and Radiation (OAR) non-CCTI science activities.

Increases over the FY2001 authorized levels include: (1) \$118.3 million, or 108.6 percent, for CCTI; and (2) \$85.0 million for the Clean Air Partnership Demonstration Fund. Decreases from the FY2001 authorized levels include: (1) \$20.9 million, or 3.8 percent, for ORD; and (2) \$53.1 million, or 41.5 percent, for OAR non-CCTI science programs.

On February 7, 2000, the EPA issued a press release that stated that this "budget includes the single largest increase in EPA's operating programs in the history of the Clinton/Gore Administration in spending for essential operations to provide cleaner air, cleaner water, safer food, and sound science." *The Committee notes that the Administration has actually cut EPA's total non-CCTI science funding for ORD and OAR by a total \$8.4 million, or 1.4 percent, from the FY 2000 appropriated levels, and by an astounding \$73.9 million, or 10.9 percent from the level authorized by the Science Committee in H.R. 1742 and H.R. 1743.* The Committee remains concerned about EPA's continuing trend of neglecting science funding and allocating resources away from ORD to OAR and other EPA program offices. These reallocations may affect the Agency's ability to perform thorough scientific research prior to implementing wide-ranging and expensive new regulations.

Finally, the Committee notes that in spite of repeated discussions and meetings with the EPA about the inadequacy of its budget information, the Agency has proved unwilling or unable to provide the Congress and the American people with the basic and fundamental information required to analyze its budget. The Committee finds it ironic that an Agency that claims to be expanding the "Public's Right-To-Know" either can not or will not provide such information.

## *NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)*

The stated mission of the National Oceanic and Atmospheric Administration (NOAA) is to describe and predict changes in the Earth's environment, and to conserve and manage the Nation's coastal and marine resources to ensure sustainable economic opportunities. NOAA conducts research to develop new technologies, improve operations, and supply the scientific basis for managing natural resources and solving environmental problems.

The NOAA programs for which the Science Committee has sole jurisdiction include the Office of Oceanic and Atmospheric Research (OAR) Climate and Atmospheric Programs, the National Weather Service (NWS), and the National Environmental Satellite, Data and Information Service (NESDIS). The Committee also shares jurisdiction with the Committee on Resources over the Office of National Ocean Service (NOS) Navigation Services, Ocean Resources and Conservation Assessment, and Acquisition of Data programs; the National Marine Fisheries Service (NMFS) Fisheries Research Vessels; OAR's Ocean and Great Lakes, National Undersea Research, and Sea Grant Programs; Program Support; Facilities; and the Office of Marine and Aviation Operations.

NOAA's total FY2001 request for budget authority is \$1,977.6 million for those programs under the Science Committee's jurisdiction. This is an increase of \$126.7 million—or 6.8 percent—above the FY2000 appropriation of \$1,850.9 million and an increase of \$57.3 million—or 3.0 percent—above total FY2001 level of \$1,920.3 million authorized by P.L. 102-567 (NOAA Authorization Act of 1992), P.L. 105-160 (National Sea Grant College Program Reauthorization Act of 1998), the House-passed version of H.R. 1553 (National Weather Service and Related Agencies Authorization Act of 1999), the Science Committee's reported version of H.R. 1552 (Marine Research and Related Environmental Research and Development Programs Authorization Act of 1999), and the House-passed version of H.R. 2086 (Networking and Information Technology Research and Development Act).

Increases over the FY2000 appropriation include: (1) \$17.2 million, or 9.2 percent, for NOS; (2) \$12.4 million, or 4.1 percent, for OAR; (3) \$53.3 million, or 8.1 percent for NWS; (4) \$41.7 million, or 7.3 percent, for NESDIS; (5) \$35.0 million, or 67.8 percent, for Program Support; and (5) \$5.3 million, or 139.9 percent for Facilities. Decreases from the FY2000 appropriation include \$35.1 million, or 68.3 percent, for NMFS; and \$3.1 million, or 13.2 percent, for the Office of Marine and Aviation Operations.

Increases over the FY2001 authorized levels include: (1) \$3.1 million, or 1.5 percent, for NOS; (2) \$16.3 million for NMFS; (3) \$2.6 million, or 0.8 percent, for OAR; (4) \$23.2 million, or 3.4 percent for NWS; (5) \$33.8 million, or 64.1 percent, for Program Support; (6) \$3.4 million, or 59.2 percent, for Facilities; and (7) \$0.2 million, or 1.2 percent, for the Office of Marine and Aviation Operations. Decreases from the FY2001 authorized levels includes \$25.2 million, or 4.0 percent for NESDIS.

Of continuing concern to the Committee is the NWS modernization program, which has been underway for over 15 years at a cost of about \$4.5 billion. The General Accounting Office (GAO) continues to identify this program as a high-risk area, and it has been the subject of a number of critical reports by the Department of Commerce Inspector General. The deployment and development of the observing systems associated with the NWS modernization are nearing completion. However, unresolved issues remain concerning the observing systems' operational effectiveness and efficient maintenance, such as performance problems with the new radars and ground-based sensors. In addition, GAO has noted that the NWS lacks a means to ensure that the modernized NWS systems provide promised returns on investment. GAO also found that NWS has not demonstrated that all proposed capabilities will result in mission improvements.

The Committee is also concerned about other programs that have been the subject of GAO and/or DOC IG reports, including the NOAA Fleet, the NOAA Corps, Polar Orbital Environmental Satellite funding, and procurement of follow-on Polar Orbital Environmental Satellites (GOES).

The Committee continues to question NOAA's plans to spend an additional \$159.9 million over the three-year period FY 2002-2004 to purchase three additional NMFS Fisheries Research Vessels. For several years,

the GAO, the Commerce Department's Inspector General, and others have urged NOAA to pursue more cost-effective approaches to research and data collection. In the past few years, NOAA has increased its contracting with the private sector, universities, and other public entities. However, NOAA continues to rely greatly on its inefficient fleet that lacks the latest available technology, and plans on replacing some of these older vessels. Continued Congressional oversight is needed to ensure that NOAA pursues more cost-effective acquisition of research data.

The Committee supports NOAA funding levels authorized either by current law or by House-passed or Committee-reported legislation. The Committee also notes that the requested increase of \$23.2 million in FY2001 for NWS is more than offset by the requested decrease of \$25.2 million for NESDIS and has no objection to redistributing NESDIS funds to NWS. The Committee does not support the requested increase for Program Support.

## **SUBCOMMITTEE ON SPACE AND AERONAUTICS**

### *NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)*

The Administration's FY2001 proposal increases the agency's budget by \$434.5 million, from a FY2000 funding level of \$13,600.8 million to the FY2001 request of \$14,035.3 million. For the first time in seven years, the Administration has requested an increase for the agency. In fact, the FY2001 request forecasts an increasing budget for NASA over the next five years. The Committee supports a stable budget for NASA that enables the agency to focus on its core missions including basic scientific research, human and robotic exploration of space, and advanced technology development.

The Committee is dedicated to building and operating the International Space Station, the largest international scientific project ever undertaken. This orbiting research laboratory will be used by scientists to conduct experiments in the unique space environment of microgravity. It will also provide a steppingstone to the future economic development of Earth orbital space and human space exploration beyond the Earth's orbit.

Unfortunately, for financial and other reasons, Russia has not met its commitments causing assembly of the International Space Station (ISS) to be delayed. Originally, the Space Station was supposed to begin assembly in November 1997. That date slipped by one year to November 1998. The first two elements of the Space Station have been mated and are currently in low Earth orbit. The third element, the Russian Service Module, originally scheduled for launch in April 1998 has been postponed repeatedly. The current estimate is a launch in the summer of 2000. The Russian Service Module is a crucial component as it provides the Station life support as well as navigation, guidance, and control. Thus, its delay causes a ripple effect throughout the entire assembly schedule. Therefore, the United States and the other international partners will be forced to endure continuing schedule delays and cost overruns until we end our dependence on Russia.

Since 1993, the Committee has supported limiting Russian participation to ISS enhancements rather than critical path components. The Committee's concerns about Russia's ability to meet its ISS commitments have been borne out. Eliminating a dependence on Russia is critically important to halt continuing delays, uncertainty, and cost growth. The Administration's budget request includes funding for an independent U.S. propulsion module and a U.S. crew return vehicle (CRV). To the maximum extent possible, these efforts must be accelerated so the U.S. can stem the rising costs of this project. The U.S. must have these capabilities in order to complete the Space Station, with or without the Russians.

A constant high priority for the Committee is the safe operation of the Space Shuttle. The Space Shuttle program has been aggressively reducing its operations costs since FY1992. A large part of the credit for the cost reduction effort is due to the ongoing consolidation of operations into a single prime contract. This contract, the Space Flight Operations Contract, was awarded to the United Space Alliance in October 1996. The contract provides for a phased approach to consolidating operations and all transitions are to be complete in FY2001. This year's request contains a significant increase in the budget for Shuttle upgrades. \$256.4

million has been included in the FY2001 budget request to finance upgrades, which are to be introduced into the fleet of orbiters by 2005. The total Shuttle upgrades budget from FY2001 until FY2005 is \$1,915.5 million. With such a significant increase to the Space Shuttle Upgrades budget, the Committee will closely monitor both the selection and the prioritization of upgrades performed to ensure that NASA selects the highest-priority safety and operability upgrades. The Committee will also closely monitor the upgrades program to ensure that Shuttle performance/life extension upgrades are not performed in the name of safety or operability.

The Committee supports the pursuit of basic research at NASA in the areas of space science and life and microgravity research. The Committee is pleased that the budget for Space Science is forecast for significant growth over the next five years. Despite recent failures in the Mars exploration program, the Committee remains committed to the concept of “faster, better, cheaper”.

The Committee continues to be concerned about the fate of life and microgravity research. Space Station research is one of the first places that experiences reductions when Space Station development runs over budget. Until FY1997, the Office of Life and Microgravity Sciences and Applications was responsible for managing the science budgets for the ISS. Since that time, management of these resources has resided in the ISS office. This shift in management made it easier for the research money to be funneled to Space Station development because it does not require prior congressional approval. FY1999 appropriations directed NASA to transfer administrative responsibility for Space Station research back to the Office of Life and Microgravity Sciences and Applications, which NASA is doing. H.R. 1654, National Aeronautics and Space Administration Act of 1999, fences the research funding and includes provisions to pay back some of the funds that were raided previously for Space Station development. The provisions of H.R. 1654 will help to ensure the taxpayers receive maximum scientific return on their multi-billion dollar investment.

The Committee will monitor NASA’s integration of the Aeronautics Research & Technology and Advanced Space Transportation Technology programs within the Office of Aero-Space Technology to ensure that there is no detrimental impact on the strategic plan goals of either program. The Committee intends to track the new focused programs relating to aeronautics, particularly those that seem to fall under the charter of the Federal Aviation Administration, rather than NASA.

One of the Committee’s highest priority goals continues to be the reduction of the high cost of space transportation, particularly for passengers and cargo between the surface and Earth orbit. The Committee believes that this goal requires both the development of newer and more capable technologies and the development of a free and competitive market in launch services. When NASA initiated a Reusable Launch Vehicle (RLV) technology program in 1995, including its X-33 “Single Stage To Orbit” demonstration project, the Committee noted that because limited funding allowed for only one copy of one experimental RLV concept, it was not clear that this program would in fact lead to a commercially-developed RLV to meet NASA’s space transportation needs. Problems in the X-33 program within the past year have borne out this concern, and the Administration has now proposed a \$4.4 billion focused program for “2<sup>nd</sup> Generation RLV” technology risk reduction over FY2001-FY2005. This new effort’s stated goal is to enable industry to competitively offer (in 2005) to develop systems that can provide commercial launch services to NASA (by 2010). While the Committee is generally supportive of this increase in funding, it will carefully monitor the evolving strategy and structure of this activity.

Committee oversight of the Earth Science Enterprise will continue to push for program accountability and a reduction in the significant cost overruns and program slips. The Committee notes with serious concern the continuing problems that plague this highly complicated program. AM-1, renamed Terra, was launched December 18, 1999. This followed a one year delay due to problems with the flight operations software. While the flight operation software has been replaced with a commercial alternative, the science processing software is still experiencing significant delays, and is not 100% capable despite Terra having already been launched. Moreover, Terra itself is experiencing problems with its flight operations which jeopardizes the satellite’s ability to achieve its mission orbit. Unfortunately, these ongoing problems seem to justify the Committee’s warnings about the unnecessary complexity of this program over the past 5 years. The Committee is also concerned with the Earth Science Enterprise’s failure to implement commercial data

purchases as the "normal way of doing business" called out by NASA policy. Despite specific steps identified at a September 10, 1998 hearing that NASA testified it would investigate, virtually no progress has been made in making commercial data purchases routine.

#### *OFFICE OF SPACE COMMERCIALIZATION*

The Office of Space Commercialization, located in the Technology Administration at the Department of Commerce, is responsible for promoting commercial space activities. The FY2001 request is \$664,000, an increase over the FY2000 funding level of \$125,000.

#### *OFFICE OF COMMERCIAL SPACE TRANSPORTATION*

The Office of Commercial Space Transportation, located in the Federal Aviation Administration at the Department of Transportation, issues licenses to commercial space transportation providers. The FY2001 request is \$12,607,000, a significant increase of \$6,047,000 over the FY2000 funding level of \$6,560,000 (as estimated by the FAA). The Committee notes the dramatic increase in the office's budget, and views this increase as consistent with the office's dramatically increased role and responsibilities in the commercial space transportation sector.

### **SUBCOMMITTEE ON TECHNOLOGY**

#### *TECHNOLOGY ADMINISTRATION/OFFICE OF TECHNOLOGY POLICY*

The Committee on Science created the Technology Administration (TA) through legislation in 1988 (the Omnibus Trade and Competitiveness Act of 1988 (P.L. 100-48)). TA consists of the National Institute of Standards and Technology (NIST), including the Advanced Technology Program (ATP) and the Manufacturing Extension Partnership (MEP); the National Technical Information Service (NTIS); and the Office of the Under Secretary for Technology/Office of Technology Policy (OTP). The TA is headed by the Undersecretary for Technology who serves as the principal adviser to the Secretary of Commerce on Technology Policy.

The Committee is pleased that the Administration's FY2001 budget request does not include funding for the Experimental Program to Stimulate Competitive Technology (EPSCoT).

#### *NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)*

##### *Scientific and Technology Research and Services (STRS)*

The Science Committee supports improving the federal infrastructure required to promote technology development. Of primary importance are the core functions of the National Institute of Standards and Technology (NIST), which are carried out under the Scientific and Technology Research and Services (STRS) budget account. The functions include: measurement and standards research in the areas of electronics and electrical engineering, manufacturing engineering, chemical science and technology, physics, materials science and engineering, fire prevention, computer systems, applied mathematics, and scientific computing.

For FY2001, the Administration's request is \$337 million for the STRS account, an increase of \$55 million from the FY2000 level. The Committee believes that NIST laboratories are its most important scientific research function and is pleased that the FY2001 request funds all laboratory accounts at their FY2000 level of activity while including an increase for new initiatives. The Committee intends to review the account's new initiative in the area of computer security to assure it is consistent with H.R. 2413, the Computer Security Enhancement Act.

Unfortunately, the Committee is disappointed that while there is an overall increase requested for the STRS account, no funding has been requested to carry out activities in support of the Teacher Science and Technology Enhancement Initiative that was enacted in 1998 as part of P.L. 105-309.

#### *Industrial Technology Services (ITS)*

The Administration's Advanced Technology Program (ATP) request for FY2001 is an increase of \$33 million over the FY2000 level. The request allows \$65 million in new grants. The Committee recommends allocating sufficient funding to cover the existing mortgages for ATP. To date, the Department of Commerce has shown only anecdotal evidence that the program has yielded any benefit to United States competitiveness. Further, the Committee continues to be concerned that federal ATP grant money may simply be displacing private investment capital.

In their 1996 report, "Measuring Performance: The Advanced Technology Program and Private-Sector Funding," the General Accounting Office (GAO) indicated that more than half of ATP grant applicants did not look for private funding before applying for an ATP grant. At a 1998 hearing before the Science Committee, GAO testified that during the 1997 awards process, ATP grant applicants were not required to report their efforts to find private funding.

Since then, new ATP rules have been instituted by the Secretary of Commerce to address this issue. However, according to GAO's testimony, the new ATP regulations are unlikely to prevent private capital from being displaced because no supporting documentation is required from grant applicants.

While the Committee believes that the new ATP regulations are a step in the right direction, more needs to be done. The Committee continues to support the legislative revisions to the NIST Act, embodied in H.R. 1744, that will ensure private capital is not displaced by public funding.

The Science Committee supports continuation of the Manufacturing Extension Partnership (MEP) program in FY2001.

#### *NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)*

NTIS is responsible for the collection and dissemination of scientific, technical, engineering, and other business-related information from federal and international sources. Declining sales attributed to increased consumer use of the Internet to obtain scientific information has raised doubts about NTIS' ability to remain self-sustaining in the future. This year, the Department of Commerce has requested a FY2000 supplemental appropriations transfer of \$4.5 million from the Advanced Technology Program (ATP) to close NTIS. The Department of Commerce also proposes transferring NTIS' core archiving functions to the Library of Congress but has yet to send formal legislation to Congress to achieve this goal. The Committee does not support the seemingly dual-track approach the Department has employed in addressing the future of NTIS. Many questions remain about the Department's draft proposal to transfer NTIS' core archiving functions to the Library of Congress. Namely, the Department has failed to provide the Committee with cost estimates on the financial impact to the Library of Congress should their proposal be adopted. Lacking this information, the Committee remains concerned that the Department's plan will do little more than shift the financial needs of NTIS from the Executive to the Legislative branch. Until the Department of Commerce provides legislation and supporting documentation to Congress, the Committee will continue to express concerns with Administration's FY2000 supplemental request to terminate NTIS.

#### *DEPARTMENT OF TRANSPORTATION (DOT)*

##### *Surface Transportation Research and Development*

The Science Committee supports the Administration's budget request of \$575 million for surface transportation research and development in FY2001. During the 105th Congress, the Committee passed H.R. 860, the Surface Transportation Research and Development Act of 1997. While many of its provisions were

incorporated into the Transportation Equity Act for the 21st Century (TEA-21), the recommended funding levels for research and development were significantly reduced. The Science Committee recognizes that sufficient funding for surface transportation research and development is essential to achieve an efficient, long-lasting and safe surface transportation system, and therefore supports increased funding for research consistent with the levels in the H.R. 860.

#### *Federal Aviation Administration (FAA) Research and Development*

The Science Committee recognizes that FAA research and development activities play an integral in developing new air traffic control and aviation safety technology. The Committee agrees with the General Accounting Office findings that certain delays in air traffic control modernization are directly traceable to weaknesses in the agency's research and development efforts. In addition, the Committee finds that the FAA needs to fully acknowledge the importance of research and development when determining annual budget levels.

The Committee continues its support for funding FAA R&D at the levels outlined in H.R. 1551, which passed by the House last year and is now part of the House and Senate Conference on H.R. 1000. H.R. 1551 authorized \$256.2 million for FAA R&D in FY2001.

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1 *Unlocking Our Future: Toward a New National Science Policy*, 1998, p. 28

2 *Id.*